

REMARKS

The present application has claims 1-17 pending. Applicants have herein amended claims 1 and 8 and has canceled claim 4. Claims 12-15 have been withdrawn from consideration in the present application for allegedly being directed to a separate and distinct invention than that of claims 1-11, 16, and 17.

Claim 1 was amended to incorporate the limitation of previously pending claim 4 – and claim 4, in turn, was canceled. Support for the amendment to claim 1 may be found throughout the subject application, including the originally-filed claim 4 and on page 5, lines 26-30, and in figures 1 to 3.

In the November 1st Office Action, the Examiner rejected claims 1-7 and 16-17 under 35 USC §103(a) as allegedly obvious over Barton, et al., U.S. Patent Publication No. 2003/0157397. Claims 8-11 were also rejected over Barton, et al. in combination with secondary reference Lertola, U.S. Patent Publication No. 2005/0255372.

In the Office Action, the Examiner admits that the Barton, et al. reference does not disclose a membrane electrode unit having gas distribution layers (GDLs) with different sizes. That is, the reference fails to teach the limitation in claim 1 requiring that the first GDL have surface dimensions smaller than those of the membrane while the second GDL have dimensions substantially equal to those of the membrane.

The Examiner, however, dismisses this limitation by alleging that it would have been obvious to a person of ordinary skill in the art to use GDLs of different surface dimensions. A prior art reference is not cited to support the Examiner's assertion, but rather the Examiner cites as support the skilled artisan's recognition of the importance of "conserving materials to reduce costs" and the artisan's recognition of "accessibility to adjacent electrode ... to improve contact with fuel cell peripherals." Based on these recognitions, the Examiner alleges that the artisan would have used GDLs of different dimensions to reduce the amount of distributor material or increase accessibility of the adjacent electrode.

Applicants disagree with the Examiner's position and maintain that the Examiner has failed to make a prima facie case of obviousness. The Examiner has not pointed to any teaching or disclosure in Barton, et al. (or in any other reference) that would provide the artisan the motivation or suggestion to modify the membrane electrode units of Barton, et al. to achieve the units of the present invention. Reliance on alleged "recognitions" of the skilled artisan is insufficient to provide motivation to modify the teachings of Barton, et al.

Moreover, the basis for the Examiner's assertions that a skilled artisan possesses certain "recognitions" is also unclear. If the Examiner is relying on personal knowledge or on an undisclosed reference for these assertions, Applicants request that the knowledge

or reference be made of record so that the basis of the assertions may be examined and possibly challenged.

Even if the Examiner's assertions are correct, one would not achieve the present invention from the Barton, et al. teachings. Recognition of the importance of "conserving materials to reduce costs" or of the "accessibility to adjacent electrode ... to improve contact with fuel cell peripherals" would not necessarily lead to the use of GDLs having different surface dimensions. Such recognitions (if true) would just as likely lead to the reduction of the surface dimensions of both GDLs equally, or to a reduction of one or more of the other components of the membrane electrode unit, such as the membrane itself.

The present invention provides a better design concept for membrane electrode units compared to that of units available in the prior art. The present invention (a) helps remove the danger of short-circuiting and (b) provides gas-tight sealing – thereby preventing hydrogen penetration. See page 3, line 24 to page 4, line 10.

As outlined in the present application, a certain portion of free ionomer membrane is necessary for an improvement of gas-tightness of the membrane electrode assembly (MEA). See page 6, line 23-24, of the specification. This aspect of the invention is not mentioned in Barton, et al. or Lertola.

In the present application, comparative electrochemical tests are provided in which open cell voltage (OCV) and hydrogen penetration current (HPC) are determined for MEAs of the present invention and for state of the art MEAs (see table 1, page 1). The state of the art MEAs are represented by coextensive designs, such as those disclosed in Barton, et al. and Lertola. As can be seen in table 1, the HPC is improved by more than a factor of 4 by use of the present invention instead of the state-of the art MEAs. This leads to a significant improvement in fuel cell performance.

Barton, et al. and Lertola fail to teach or even to recognize this aspect of the present invention. Specifically, the references fail to teach, disclose or suggest the inventive aspect that the use of GDLs of different surface dimensions – wherein one GDL has dimensions smaller than those of the membrane, while the other GDL has dimensions substantially equal to those of the membrane – increases the gas-tight sealing of the MEA, and thus, reduces hydrogen penetration.

Moreover, the references also fail to teach, disclose or suggest the added limitation of amended claim 1 wherein a portion of the front side of the membrane is not supported by the first GDL.

Furthermore, with respect to the Lertola reference, this reference teaches "fluid impermeable" seals, i.e., the sealing rim must be non-permeable to liquids. In contrast,

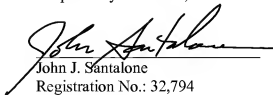
the present invention teaches a design concept for gas-tight sealing in order to prevent hydrogen penetration.

In light of the amendments and remarks above, Applicants request reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a) set forth in the November 1, 2007 Office Action and respectfully solicit allowance of the present application.

No fee is deemed necessary in connection with the filing of this amendment, other than the fee for the requested three-month extension of time. If any additional fees are due, or an overpayment has been made, please charge, or credit, our Deposit Account No. 11-0171 for such sum.

If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicants' attorney at the telephone number provided below.

Respectfully submitted,


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